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# RESERVE COPY PATENT SPECIFICATION

619,338

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## PROVISIONAL SPECIFICATION

### Improvements in and relating to Parallel Rules

I, WILLIAM BLAINE LUARD, Commander, R.N. (Ret'd.), of Trelour, Mawnan Smith, near Falmouth, Cornwall, British Subject, do hereby declare the nature of this invention to be as follows:—

This invention relates to parallel rules, of the kind in which two rulers are interconnected by a pair of crossed rigid links of equal length interpivoted scissors-like at their midlengths with their ends sliding in guides extending longitudinally along the rulers.

The object of the invention is to provide an improved construction of parallel rule of the above described kind to which an attachment can be readily applied, and to provide such attachment, whereby the rule becomes better adapted for navigational and other purposes, so that true, magnetic, or compass courses or bearings can be drawn on a chart without reference to the compass rose marked on such chart.

Accordingly, in a parallel rule consisting of two rulers interconnected by a pair of crossed rigid links of equal length normally interpivoted scissors-like at their midlengths with their ends sliding in guides extending longitudinally along the rulers, according to the present invention a further guide is provided longitudinally along each ruler wherein a bracket terminating in a compass rose can slide.

According to another feature of the invention, one, the lower, of the rigid links which interconnect the two rulers, is formed at intervals on each side of its midlength with additional holes, for instance two each side, for the alternative reception of the pivot pin, so that, when the pivot pin is in one of these holes, one ruler can be swung about the other ruler, instead of remaining parallel thereto.

To enable the pivot pin to be readily released from any pivot hole of the lower link, the pivot pin is provided by the extremity of a plunger housed in a tubular casing mounted on the upper

link and enclosing a helical spring surrounding the plunger and bearing respectively against a collar thereon and against the closed upper end of the casing, through which the upper end of the plunger projects and above which it is provided with a manipulating knob.

The additional guide along each ruler conveniently is an undercut groove in the upper surface.

The guides for the ends of the crossed links are likewise undercut grooves, the ends of the links being each pivoted on a pin upstanding from a slide block confined in the respective groove and pressed upwards by a plate spring to avoid slackness.

The bracket of the compass rose attachment is secured to the underside of the border of a plate, having also on its underside a rib of dovetail cross section fitting the additional guide groove in either ruler.

The compass rose attachment comprises a compass rose, preferably of transparent material, marked with degrees anti-clockwise 0°-360° and quadrantal, with the North-South line parallel to the sliding connection with the ruler and therefore also to the rule.

Inside the circle of degree markings, the compass rose has a segment on each side of the North point marked with a scale representing magnetic variation.

On the compass rose, a similar but smaller compass rose is concentrically pivoted. This upper compass rose has a segment on each side of its North point marked with a scale of deviations East or West. The magnetic variation scale marked on the underneath, larger rose is visible through a gap at each end of the deviation scale, or through the transparent material of the upper rose.

Nearer the centre, a segmental scale marked to give compass error East and West, viz., the combination of both magnetic variation and deviation, can be provided on the lower rose.

By means of the interpivoted compass

[Price 2/-]

roses, the parallel rule can be set to mark off a magnetic course using the magnetic variation scale, a compass course using also the deviation or compass error scale, or a true course using the lower compass rose.

The compass roses can also be slid off the rule and used independently to convert true courses or bearings to magnetic or compass, and magnetic to compass and *vice versa*.

A panel can be marked on the upper rose wherein a pencil note of the deviation can be made, or such can be made on the underneath rose through a gap in the upper rose.

The pivot of the two roses conveniently is tubular to enable a meridian on a chart to be seen therethrough, even although visible through the material of the roses if transparent.

An elongated laterally grooved block may be provided on each ruler to serve as a hand grip.

If the upper compass rose is not transparent, a segmental slot is provided in the upper rose through which the variation and compass error scales on the lower rose can be viewed.

The scissors-like links can be slid out of the grooves in the rulers which can then be used as ordinary rulers.

A stop is provided on one link to be encountered by the other link and prevent them from being opened apart so far as to jam.

The scissors links can be as long as desired, the longer they are, the more the perpendicular movement and the less the parallel sliding movement on separating the rulers.

Various scales can be marked on the rule, including a protractor scale of degrees.

Dated this 3rd day of December, 1946.

PHILLIPS & LEIGH,  
Agents for the Applicant.

#### COMPLETE SPECIFICATION

#### Improvements in and relating to Parallel Rules

I, WILLIAM BLAINE LUARD, Commander, R.N. (Ret'd.), of Trelour, Mawnan Smith, near Falmouth, Cornwall, British Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to parallel rules, of the kind in which two rulers are interconnected by a pair of crossed rigid links of equal length interpivoted scissors-like at their midlengths with their ends sliding in guides extending longitudinally along the rulers.

The object of the invention is to provide an improved construction of parallel rule of the above described kind to which an attachment can be readily applied, and to provide such attachment, whereby the rule becomes better adapted for navigational and other purposes, so that true, magnetic or compass courses or bearings can be drawn on a chart without reference to the compass rose marked on such chart.

Accordingly, in a parallel rule consisting of two rulers interconnected by a pair of crossed rigid links of equal length normally interpivoted scissors-like at their mid-lengths with their ends sliding along guides extending longitudinally along the rulers, according to the present invention a further guide is provided longitudinally along either or each ruler wherein a compass rose attachment can slide.

According to another feature of the invention, one, the lower, of the rigid links which interconnect the two rulers, may be formed at intervals on each side of its midlength with additional holes, for instance two each side, for the alternative reception of the pivot pin, so that, when the pivot pin is in one of these holes, one ruler can be swung about the other ruler, instead of remaining parallel thereto.

Representative examples of parallel rules according to the invention, and of a compass rose attachment to be mounted thereon, are shown in the accompanying drawings in which:—

Fig. 1 is a plan of a parallel rule.

Fig. 2 is a cross section on the line 2-2 of Fig. 1.

Fig. 3 is a vertical section of a detail on a larger scale.

Fig. 4 is a broken plan of a modified parallel rule.

Fig. 5 is a vertical section of a detail on a larger scale.

Fig. 6 is a plan of a compass rose attachment.

Fig. 7 is a plan of the top card of the compass rose, and

Fig. 8 is a plan of the bottom card of the compass rose.

Referring more particularly to Figs. 1-3, *a* is one ruler of a parallel rule and *b* is the other ruler thereof. The two rulers *a* and *b* are interconnected by a pair of crossed rigid links *c*, *d* of equal length interpivoted scissors-like at their

midlengths with their ends pivoted to slide blocks *f*, sliding in an undercut guide groove *g* extending longitudinally along each ruler *a*, *b*.

- 5 The slide blocks *f* are stopped from leaving the grooves *g* by encountering the heads of screws *g*<sup>1</sup> at the ends of the grooves.

- 10 In addition to the guide groove *g* in each ruler *a*, *b*, an additional longitudinal undercut guide groove *h* is provided in each ruler *a*, *b*. This additional guide groove *h* serves to receive a feather *i*<sup>1</sup> of dovetail cross section of a slide block *i*, Fig. 6, whereby a rotatable compass rose *j* can be attached to either ruler *a* or *b*, so that true magnetic or compass courses or bearings can be drawn on a chart without reference to the compass rose marked on such chart.

- 20 Studs *d*<sup>1</sup> on the lower link *d* prevent the rulers *a*, *b* being separated so far as to jam the links.

- 25 In addition to serving to mount a compass rose, the second groove *h* in each ruler *a*, *b* can serve to receive the slide blocks *f* at one end of links *c*, *d* of another parallel rule from which one of the rulers *a* or *b* has been detached.
- 30 Thus a parallel rule built up of three rulers interconnected by two sets of crossed links *c*, *d* can be formed, having correspondingly increased capability of extension.

- 35 Each ruler *a* and *b* is formed on the underside with ribs *k*, Fig. 2, which tend to grip the surface of a chart and prevent the ruler slipping thereon.

- 40 Also to grip the surface of a chart the manipulating knob *l*, Figs. 1 and 3, of each ruler *a*, *b* is fitted with a pointed ended depressible plunger *l*<sup>1</sup>, retracted by a spring *l*<sup>2</sup>.

- 45 As shown in Fig. 4, the lower rigid link *d* can be formed at intervals on each side of its midlength with additional holes *d*<sup>2</sup>, for instance two on each side as shown, for the alternative reception of the pivot pin *m*, so that when the pivot pin *m* is in one of these additional holes *d*<sup>1</sup>, one ruler *a* or *b* can be swung about the other ruler *b* or *a*, instead of remaining parallel thereto.

- 50 To enable the pivot pin *m* to be readily released from any pivot hole of the lower link *d*, the pivot pin *m* is, as shown in Fig. 5, provided by the extremity of a plunger *m* housed in a tubular casing *m*<sup>1</sup> mounted on the upper link *c* and enclosing a helical spring *m*<sup>2</sup>, surrounding the plunger *m* and bearing respectively against a collar *m*<sup>3</sup> thereon and against the closed upper end of the casing *m*<sup>1</sup>, through which the upper end
- 65 of the plunger *m* projects and above

which it is provided with a manipulating knob *m*<sup>4</sup>.

The compass rose attachment consists of the slide block *i* on which a lower compass card disc *n* is secured and on and concentric with which the smaller rotatable compass rose card disc *j* is mounted, by a tubular pivot *o*. The slide block *i* is provided with a manipulating handle *i*<sup>2</sup> and with a clamping screw *i*<sup>3</sup>.

The North-South line *n*<sup>1</sup> of the lower compass card *n* is parallel to the sliding connection by the feather *i*<sup>1</sup> and therefore to the ruler *a* or *b* to which the compass rose attachment is attached.

Both compass cards *n* and *j* are marked with degrees anti-clockwise 0°-360° and quadrantly.

Inside the circle of degree markings, the lower compass card *n* has a segment *n*<sup>2</sup> extending each side of the North point marked with a scale representing magnetic variation.

Nearer the centre, a segmental scale *n*<sup>3</sup> marked to give compass error East and West, viz., the combination of both magnetic variation and of deviation, is provided on the lower compass card *n*.

The upper and smaller compass card *j* is marked with the points of the compass and also is marked on a segment *j*<sup>1</sup> on each side of its North point with a scale of deviation East and West. The magnetic variation scale *n*<sup>2</sup> marked on the underneath, larger compass card *n* is visible through a gap *j*<sup>2</sup> extending outside and at each end of the deviation scale *j*<sup>1</sup>. Alternatively the upper compass card *j* can be of transparent material to permit scales on the underneath card *n* to be read therethrough. The lower compass card *n* can also be transparent. If the upper compass card *j* is not transparent, a slot *j*<sup>3</sup>, indicated in dot-dash lines in Fig. 7, is provided in the upper compass card *j*, extending on each side of a deviation arrow *j*<sup>4</sup> and through which the compass error scale *n*<sup>3</sup> of the lower compass card *n* is visible.

By means of the interpivoted compass cards *n*, *j*, the parallel rule can be set to mark off a magnetic course or bearing using the magnetic variation scale *n*<sup>2</sup>, a compass course using also the deviation scale *j*<sup>1</sup> or the compass error scale *n*<sup>3</sup>, or a true course using the lower compass card *n*.

The compass cards *n* and *j* when the compass rose attachment has been slid off the parallel rule, can be used independently to convert true courses or bearings to magnetic or compass and vice versa.

A gap *j*<sup>5</sup> is provided in the upper compass rose *j* through which a pencil note

of the deviation can be made on a paper disc *p* interposed between the two cards *n* and *j*, or a panel can be marked on the upper card wherein such can be noted.

5 The pivot *o* of the compass card *j* being tubular enables a meridian on a chart to be seen therethrough even if also visible through the material of the two cards if these are transparent.

10 The scissors links *c*, *d* can be as long as desired up to the limit imposed by the length of the rulers *a*, *b*. The longer they are the more the perpendicular movement and the less the parallel sliding movement on separating the rulers until the link *c* reaches the stops *d*<sup>1</sup> on the link *d*.

20 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In a parallel rule consisting of two rulers interconnected by a pair of crossed rigid links of equal length normally inter-pivoted scissors-like at their mid-lengths with their ends sliding along guides extending longitudinally along said rulers, a construction in which a further guide is provided longitudinally

along either or each ruler wherein a compass rose attachment can slide.

2. A parallel rule as claimed in claim 1, wherein the ends of said crossed links are pivoted on slide blocks sliding in an undercut groove extending longitudinally along each ruler, in which either or each ruler is provided with an additional like guide groove parallel thereto.

3. A parallel rule as claimed in claim 1 or 2, in which the compass rose attachment consists of a slide block fast with a compass card having a smaller compass card rotatably mounted concentrically thereon, said compass cards bearing magnetic variation and deviation scales or a combined compass error scale.

4. A parallel rule as claimed in claim 1 or 2, in which one of said crossed links is formed with alternative holes on each side of its midlength for the pivoting thereon of the other link.

5. The improved parallel rule substantially as described with reference to the accompanying drawings.

Dated this 7th day of November, 1947.

PHILLIPS & LEIGH,

Chancery Lane Station Chambers,  
31/33, High Holborn, London, W.C.1.  
Agents for the Applicant.

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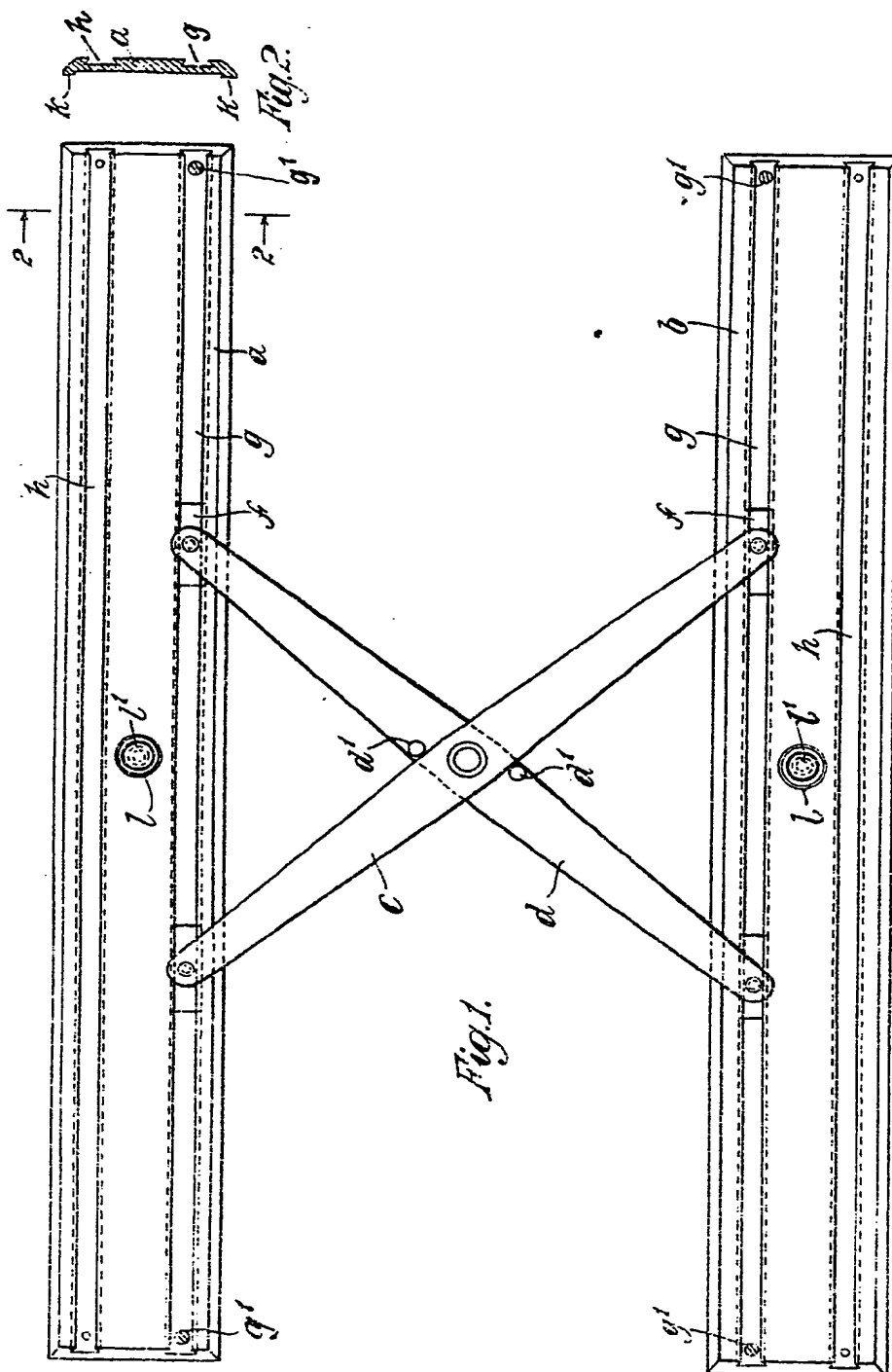
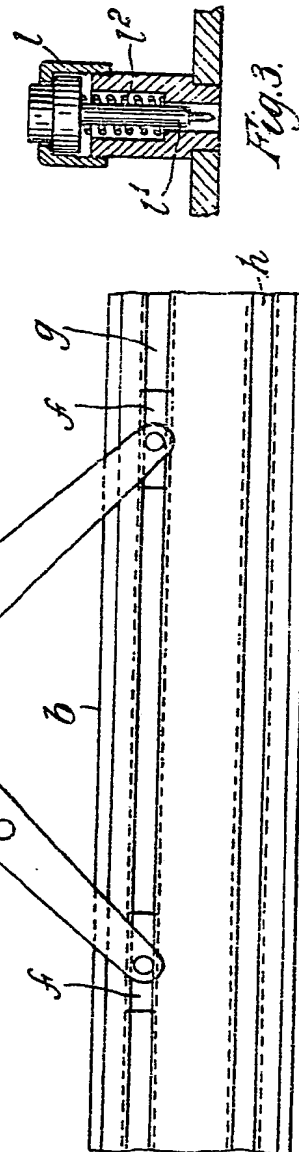
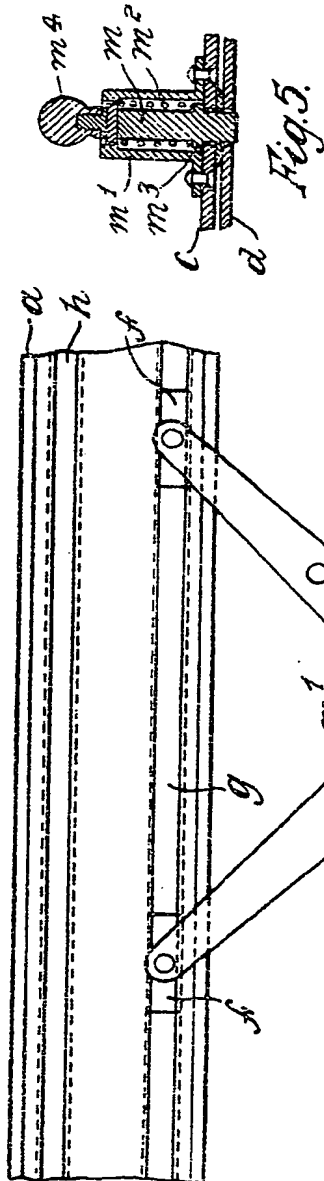
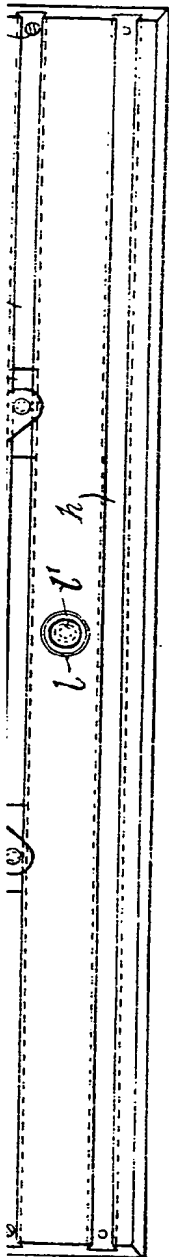
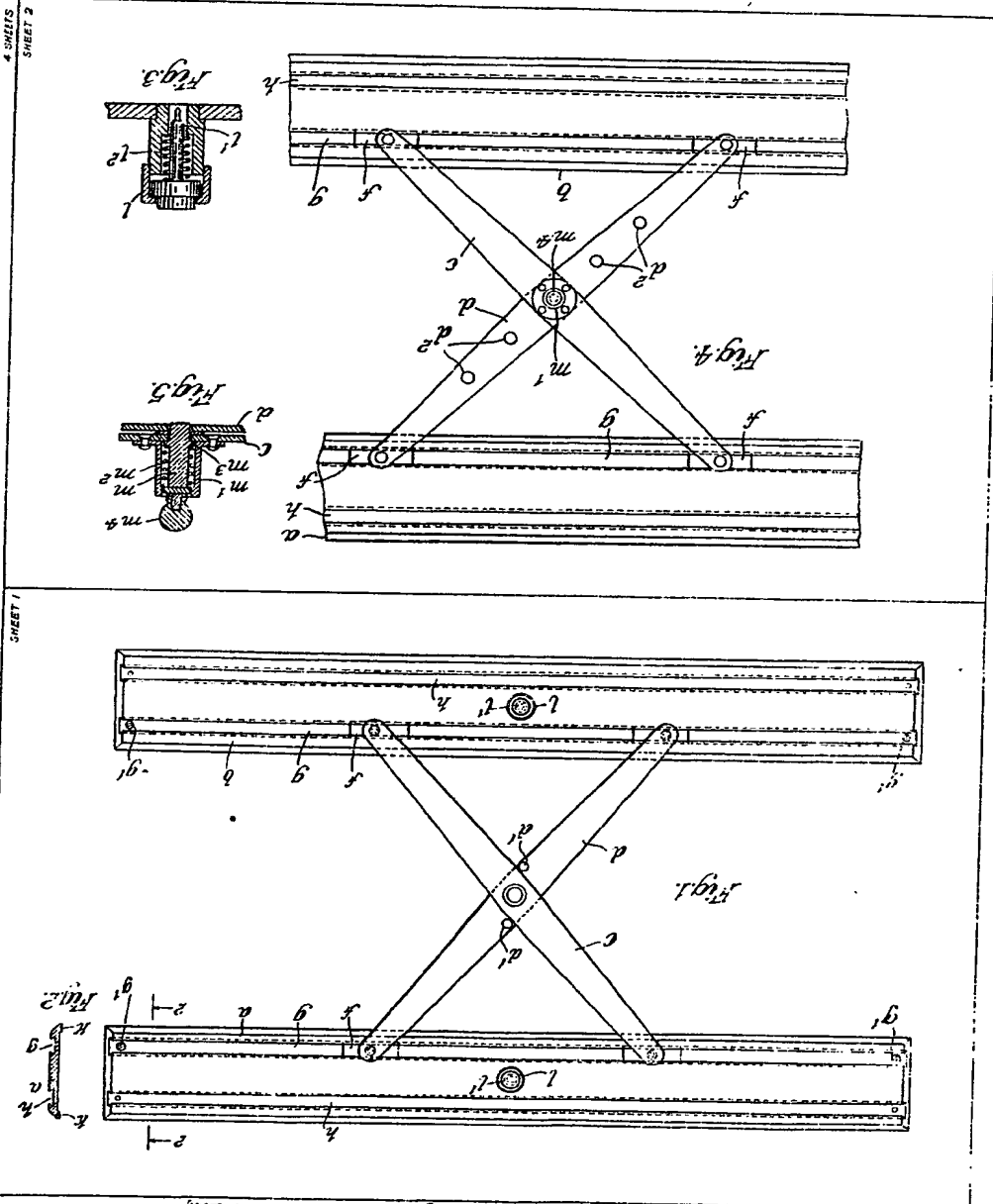


Fig. 1.

Fig. 2.







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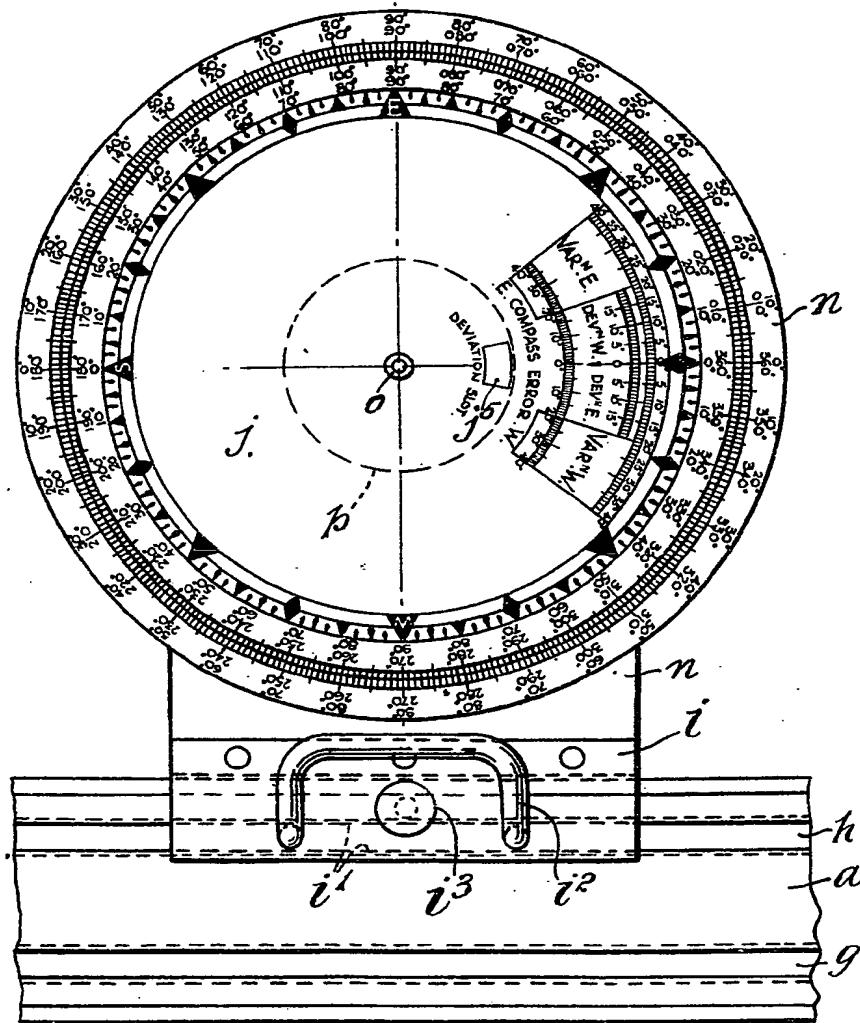


Fig. 6.

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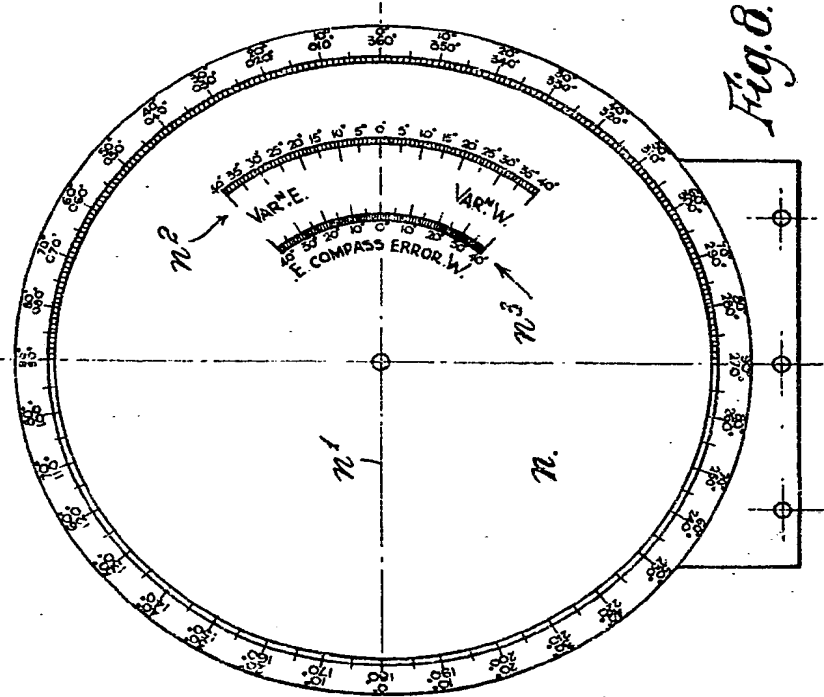


Fig. 8.

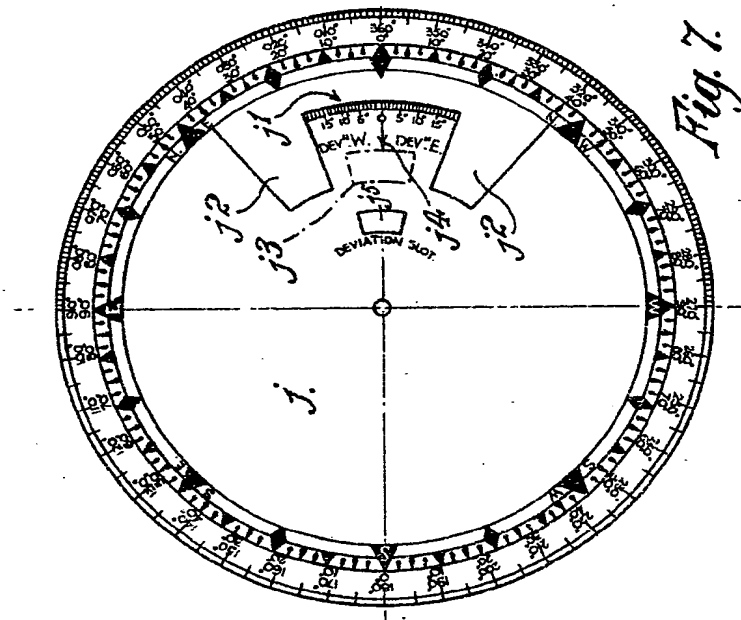


Fig. 7.

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